

## SUMMARY AND CONCLUSIONS

The major conclusions from this study are as follows:

- 1) Shell disease lesions in blue crabs from the Pamlico River have many bacteria that possess enzymatic activities, including lipase and chitinase, that are potentially capable of degrading the shell.
- 2) The shell of clinically normal blue crabs from Core Sound also has large numbers of bacteria that have similar enzymatic properties.
- 3) Blue crabs possess a potent antibacterial activity in their hemolymph which can kill a wide range of the flora both from the shell of clinically healthy blue crabs as well as bacteria isolated from shell disease lesions.
- 4) The blue crab antibacterial activity is bactericidal, pH and temperature-sensitive, and inhibited by sodium chloride. It is also very stable after multiple freeze-thaw cycles and after prolonged storage at  $-70^{\circ}\text{C}$ , making it easy to collect and archive for assay.
- 5) There are marked differences in the immunocompetence of individual blue crabs in the A/P Estuary, as indicated by levels of antibacterial activity:
  - a) Blue crabs with shell disease have significantly lower levels of antibacterial activity than clinically normal blue crabs.
  - b) Blue crabs in the riverine parts of the A/P Estuary have significantly lower antibacterial activity than do blue crabs from the more oceanic parts of the system.
- 6) Blue crabs in the Pamlico River have significantly lower levels of hemocyanin than do crabs from the more oceanic reference site. The cause of the depressed hemocyanin levels is unknown.
- 7) There is no difference in hemocyanin levels between clinically normal blue crabs and those having shell disease. However, since Pamlico River crabs had lower hemocyanin levels than crabs from oceanic sites, the relationship of shell disease development to hemocyanin levels is uncertain.
- 8) Copper, cadmium or zinc levels are not important factors in the prevalence of shell disease in the blue crabs of the A/P Estuary.